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United States, *B. lunarioides*, Gray, of Texas and Mexico.

In most of the East India species the nervation is more crowded than in the fossil leaves before us, each nerve having three, and sometimes four lateral nerves, the medial nerve however, being quite the same. In several oriental species, and all those of the New World, the nervation is simpler, and essentially like that of the fossil. In the Texan species the leaves are generally divided to the base, and the medial nerve is therefore obsolete; the lateral nervation is, however, precisely that of our fossil. As the depth of the sinus is a variable character, differing greatly in the leaves of the same tree, it is quite possible that our *Bauhinia lunarioides* is only a dwarfed and slightly modified descendant of the Cretaceous species.

EXPLANATION OF PLATE LVI.

Figs. 1 and 2. *Bauhinia tomentosa.* India.
Fig. 3. *B. porrecta.* Cuba.
Fig. 4. *B. parvifolia.* India.
Fig. 5. *B. cretacea.* N.

Dendrological Notes.

BY C. S. SARGENT.

The late Mr. S. B. Buckley, many years ago published (Am. Journ. Sci., 2d Ser., Vol. xxvii., March, 1859, p. 289) an interesting account of the forests and trees of the Big Smoky Mountain region of North Carolina and Tennessee. I am glad to be able to bear witness to the accuracy of Mr. Buckley's observations recorded in this paper, which has only recently become known to me. Mr. Buckley's interesting discovery of *Quercus Leana* on the banks of the Tennessee River near Franklin, in Macon County, seems to have passed unnoticed from that day to this. His determination of this plant was doubtless correct, however, for last September I found *Q. Leana* on one of the main forks of the Tennessee—the Tuckaseego, at Charleston, in Swaine County—where a single small tree growing with *Q. imbricaria* was seen. *Quercus Leana* is now known from the neighborhood of Washington to Missouri, and has been found in several remote and isolated localities. It is probably of recent hybrid origin.

The loose scales of the cup and the pubescense upon the underside of the leaves seem to point to *Q. tinctoria* rather than to *Q. coccinia*, as suggested by Dr. Engelmann as one of its parents. But whatever may have been its origin, it is an interesting question whether a plant so widely distributed and so constant in its character as *Q. Leana*, has not now a sufficiently permanent hold of its own upon existence to be considered a species, especially as it cannot, even with the broadest extension of any of the recognized species, be referred, as a form, to any of these. The status of *Q. Leana* is identical, although it is more widely distributed, with that of *Q. heterophylla*. Both seem to be of comparatively recent hybrid origin, and both have become so fixed in character, that it is perhaps permissible to consider them as species. Mr. Buckley called attention to the immense size of many individual trees in the Big Smoky Mountains. Here, as he pointed out, is the true home of *Abies Fraseri*, which often attains a height of 100 to 150 feet, with a trunk from 3 to 4 feet in diameter. *Halesia* here becomes a large forest tree, with a clean straight stem, often 60 feet to first branch, and 3 to 4 feet in diameter. Specimens of *Æsculus flava* 4 feet in diameter, are common, and nowhere else can finer Hemlocks, Liriodendrons or Chestnuts be seen. *Ilex monticola* becomes a considerable tree, 30 or 40 feet high, with a trunk 6 to 8 inches in diameter.

Nowhere else, I believe, in North America, can so many arborescent species be found in such a limited area, as in the Big Smoky Mountains. We counted sixty-eight species, or nearly one-sixth of all the arborescent species of North America, north of Mexico, between Charleston, on the Tuckaseego, and the summit of Andrew's Bold, a bald spur of Clingman's Dome, 5,764 feet above the ocean, the whole distance by the trail being but thirteen miles. These bald spots in the Smoky Mountains are very generally covered with thickets of *Vaccinium Erythrocarpon*, often 5 or 6 feet high, and which in September were loaded with fruit often more obovate than round, and when fully ripe, is jet black, shining, very juicy, but rather insipid. The bushes everywhere broken down, indicate that the bears find it palatable.

Mr. Buckley does not mention the discovery of *Magnolia cordata*, and later travellers have not been more fortunate in this respect. Indeed, it is not probable that this tree, as is also true of *Gordonia pubescens*, has been seen at all since its original discovery. The younger Michaux's *Magnolia cordata*, from the banks of the Savannah River, near Augusta, probably belonged to a not uncommon form of *M. acuminata*, with broad, and often cordate leaves, and with light yellow flowers. Here too, I believe, belongs Mr. Mohr's Alabama plant, referred to *M. cordata*, in the Census Report upon the Forests of the United States.

It is not known when the elder Michaux dicovered his *Magnolia cordata*. The early part of his journal is missing, but late in the autumn of 1787 he made a long and arduous journey to the mountains of South Carolina, principally for the purpose of collecting young trees of this species, so that it is fair to suppose that he had discovered it on some previous journey, the record of which, unfortunately, has not been preserved. He ascended the Keowee, to where the head of the river is formed by two rapid mountain streams, now laid down on the map as the Devil's Fork and White Water Creek, and here on steep mountain slopes, overlooking these streams, he found *Magnolia cordata* in abundance. This was in the month of December, and as he seems to have had no difficulty in distinguishing the species without leaves, he must have become familiar with it previously, and probably in this very locality. The cultivated plants by which this species is now only known must be all descended from the seedling trees collected by Michaux in this winter journey, during which he nearly froze to death, and barely escaped starvation.

Magnolia cordata should be looked for then, in the high and very broken country a little to the southeast of Highlands, in Macon County, North Carolina, and between that place and Cousin's Head, in South Carolina. The trail from White Head, near Highlands, to Cæsar's Head, crosses the sources of all the small streams which form the Keowee, and this region is probably most easily entered from this direction. No botanist since Michaux, so far as I have been able to learn, has ever visited it. It is reported to be entirely unsettled, very rough and broken, and covered with magnificent forests of immense trees. It was just on the northern border of this region that *Rhododendron Vaseyii* was discovered a few years ago. It offers an inviting field for botanical exploration. Well developed fruit of *Magnolia cordata* is not known.

Fern Notes, VIII.

By Geo. E. Davenport.

Aspidium Lonchitis, Swartz.—This fine evergreen fern was found growing on Mt. Peddo (Adams), Washington Territory, in August, 1885, by W. N. Suksdorf, of White Salmon. The plants were growing on shady rocks at an altitude of from 6,000 to 7,000 feet, and show all the typical characteristics of the species. One interesting dwarf specimen has perfectly fruited, excessively spiny fronds only 3 inches high, and from ½ to ¾ of an inch broad.

Aspidium aculeatum, Swartz, var. *scopulinum*, D. C. Eaton, *Botrychium ternatum* Swartz—previously collected in a larger form in Falcon Valley, and on the Columbia; *Botrychium matricariæfolium*, A. Br., *Botrychium simplex*, Hitch., plants very fleshy, and *Lycopodium alpinum*, L., were also collected on Mt. Peddo.

The specimens of *B. ternatum* partake of the California forms of that species, but are much smaller. Those of *B. matricariæfolium* well sustain the character of the species for variation, and their buds conform to the characters previously pointed out. (Torr. Club Bulletin, vol. vi., pp. 194, 196, 198; vol. xii., p. 23.)

Mr. Suksdorf, who is doing excellent service for the flora of his region, has also collected an interesting form of *Polypodium vulgare*, L., with long, narrow fronds, and very bluntly rounded obtuse divisions; an alpine form of *Polypodium falcatum*, Kellog, not readily determined but for the very decided liquorice-tasting root-stock; *Isoetes Nuttallii*, A. Br., *Marsilia vestita*, H. and G., and *Azolla Caroliniana*, Willd.

Texan Ferns.—From J. Reverchon, Dallas, Texas, I have received one of the most interesting and valuable collections of ferns made for a long time, the following being of special interest to botanists:

Pellæa aspera, Baker.—Fine specimens sparingly collected on